

# Exhibit E



# Coronavirus Disease 2019

## Clinical Questions about COVID-19: Questions and Answers

Updated June 4, 2020

### COVID-19 Risk

**Are there work restrictions recommended for HCP with underlying health conditions who may care for COVID-19 patients? What about for pregnant HCP?** +

Adherence to recommended infection prevention and control practices is an important part of protecting HCP and patients in healthcare settings. All HCP who care for confirmed or suspected COVID-19 patients should adhere to [standard and transmission based precautions](#).

To the extent feasible, healthcare facilities could consider prioritizing HCP who are not at higher risk of developing severe illness from COVID-19 or who are not pregnant to care for confirmed or suspected COVID-19 patients.

If staffing shortages make this challenging, facilities could consider restricting HCP at higher risk for severe illness from COVID-19 or who are pregnant from being present for higher risk procedures (e.g., [aerosol-generating procedures](#)) on COVID-19 patients. Find more information for facilities on [mitigating HCP staffing shortages](#).

HCP who are concerned about their individual risk for severe illness from COVID-19 due to underlying medical conditions while caring for COVID-19 patients can discuss their concerns with their supervisor or occupational health services.

People 65 years and older and people of all ages with serious [underlying health conditions](#) — like serious heart conditions, chronic lung disease, and diabetes — seem to be at higher risk of developing severe illness from COVID-19.

Information on COVID-19 in pregnancy is limited. Pregnant women are not currently considered at increased risk for severe illness from COVID-19. However, pregnant women have had a higher risk of severe illness when infected with viruses from the same family as COVID-19 and other viral respiratory infections, such as influenza. Find more information on [pregnancy](#) and risk for severe illness from COVID-19.

**I am a HCP living with someone who is at higher risk of severe illness from COVID-19. What precautions should I take?** +

Take the same [precautions recommended for people at higher risk](#) of severe illness from COVID-19. There are no additional precautions for HCP. Some HCP may choose to implement extra measures when arriving home from providing healthcare, such as removing any clothing worn during delivery of healthcare, taking off shoes, washing clothing, and immediately showering. However, these are optional personal practices because there is insufficient evidence on whether they are effective.

**Who is at risk for infection with the virus that causes COVID-19?** +

Currently, those at greatest risk of infection are persons who have had prolonged, unprotected close contact with a patient with symptomatic, confirmed COVID-19 and those who live in or have recently been to areas with sustained transmission. For more information, see [Risk Assessment](#).

Who is at risk for severe disease from COVID-19?



The available data are currently insufficient to clearly identify risk factors for severe clinical outcomes. Based on limited data that are available for COVID-19 patients, and data from related coronaviruses such as severe acute respiratory syndrome coronavirus (SARS-CoV) and MERS-CoV, people who may be at risk for more severe outcomes include older adults and persons who have certain [underlying chronic medical conditions](#). Those underlying chronic conditions include chronic lung disease, moderate to severe asthma, cardiac disease with complications, diabetes, or immunocompromising conditions. See also [Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease 2019 \(COVID-19\)](#) and [Information for Healthcare Professionals: COVID-19 and Underlying Conditions](#).

If my patient has an underlying medical condition, what is my patient’s risk of acquiring or having severe illness from COVID-19, and what should I tell my patient?



- There is insufficient information on COVID-19 to determine the level of risk for each underlying medical condition. CDC is analyzing data continuously and provides updates as soon as new information is available.
- You know your patient’s overall health and how well their conditions are managed. Use your clinical judgement to evaluate on a case by case basis. Patients frequently in congregate settings are at increased risk of infection. Patients with [underlying medical conditions](#) may be at increased risk of severe disease.
- If possible, work with patients to manage their underlying condition to the best of their ability, including ensuring that patients have sufficient medication and supplies. Prescribing three-month supplies of medications may help ensure access to sufficient medications.
- Explain to all patients which symptoms of their chronic conditions require emergency care or in-person visits. Stress the importance of obtaining emergency care if needed.
- Reassure your patients who require emergency care that emergency departments have infection prevention plans to protect them from acquiring COVID-19
- Tell patients with [underlying medical conditions](#) that increase their risk of severe illness or poorer outcomes from COVID-19:
  - To stay home as much as possible to reduce their risk of being exposed.
  - Closely follow their care plans for management of their chronic disease, including, for example, achieving better glycemic or blood pressure control.
  - Seek emergency care for acute exacerbations of their underlying medical conditions or any health condition that requires immediate attention.
- Encourage all patients, regardless of risk, to:
  - Take [steps](#) to protect yourself.
  - **Call** your healthcare provider if you are sick with a fever, cough, or shortness of breath.
- Follow CDC [travel guidelines](#) and the recommendations of your state and local health officials. Fear and anxiety about a disease can feel overwhelming, especially for those who might be at higher risk or are experiencing social isolation, and for healthcare providers that are treating patients at higher risk. [Do what you can to take care of your mental health and encourage your patients to do the same.](#)

Additional resources for healthcare providers

Are pregnant healthcare personnel at increased risk for adverse outcomes if they care for patients with COVID-19?



Pregnant healthcare personnel (HCP) should follow [risk assessment](#) and [infection control](#) guidelines for HCP exposed to patients with suspected or confirmed COVID-19. Adherence to recommended infection prevention and control practices is an important part of protecting all HCP in healthcare settings. Information on COVID-19 in pregnancy is very limited; facilities may want to consider limiting exposure of pregnant HCP to patients with confirmed or suspected COVID-19, especially during higher risk procedures (e.g., aerosol-generating procedures) if feasible based on staffing availability.

What is multisystem inflammatory syndrome in children (MIS-C) and who is at risk? +

CDC is investigating reports of multisystem inflammatory syndrome in children (MIS-C) associated with COVID-19. Patients with MIS-C have presented with a persistent fever and a variety of signs and symptoms including multiorgan (e.g., cardiac, gastrointestinal, renal, hematologic, dermatologic, neurologic) involvement and elevated inflammatory markers. CDC is collaborating with domestic and international partners to better understand this new syndrome, including how common it is and its risk factors, and to begin tracking cases. For more information, including a full case definition, visit [MIS-C Information for Healthcare Providers](#).

Transmission

When is someone infectious? +

The onset and duration of viral shedding and the period of infectiousness for COVID-19 are not yet known. It is possible that SARS-CoV-2 RNA may be detectable in the upper or lower respiratory tract for weeks after illness onset, similar to infections with MERS-CoV and SARS-CoV. However, detection of viral RNA does not necessarily mean that infectious virus is present. There are reports of asymptomatic infections (detection of virus with no development of symptoms) and pre-symptomatic infections (detection of virus prior to development of symptoms) with SARS-CoV-2, but their role in transmission is not yet known. Based on existing literature, the incubation period (the time from exposure to development of symptoms) of SARS-CoV-2 and other coronaviruses (e.g. MERS-CoV, SARS-CoV) ranges from 2–14 days.

Which body fluids can spread infection? +

SARS-CoV-2 RNA has been detected in upper and lower respiratory tract specimens, and SARS-CoV-2 virus has been isolated from upper respiratory tract specimens and bronchoalveolar lavage fluid. SARS-CoV-2 RNA has been detected in blood and stool specimens, and SARS-CoV-2 virus has been isolated in cell culture from the stool of some patients, including a patient with pneumonia 15 days after symptom onset. The duration of SARS-CoV-2 RNA detection in upper and lower respiratory tract specimens and in extrapulmonary specimens is not yet known but may be several weeks or longer. Duration of several week or longer has been observed in cases of MERS-CoV or SARS-CoV infection. While viable, infectious SARS-CoV has been isolated from respiratory, blood, urine, and stool specimens, viable, infectious MERS-CoV has only been isolated from respiratory tract specimens. It is not yet known whether other non-respiratory body fluids from an infected person including vomit, urine, breast milk, or semen can contain viable, infectious SARS-CoV-2.

Can people who recover from COVID-19 be re-infected with SARS-CoV-2? +

The immune response, including duration of immunity, to SARS-CoV-2 infection is not yet understood. Patients with MERS-CoV are unlikely to be re-infected shortly after they recover, but it is not yet known whether similar immune protection will be observed for patients with COVID-19.

Testing, Diagnosis, and Notification

How do you test a patient for infection with SARS-CoV-2? +

- Clinicians are able to access laboratory testing through state and local public health laboratories, as well as commercial and clinical laboratories across the country. The [Association of Public Health Laboratories](#) provides a list of states and territories with laboratories that are using COVID-19 viral tests. For more information, see [Testing in U.S.](#) Clinicians should direct testing questions to their [state health departments](#). Commercial reference laboratories are also able to offer a larger volume of testing for SARS-CoV-2.
- CDC has [guidance](#) for who should be tested, but decisions about testing are at the discretion of state and local health departments and/or individual clinicians.

- Healthcare providers should report positive results to their local/state health department CDC does not directly collect these data directly.
- See recommendations for prioritization of testing, and instructions for specimen collection at [Evaluating and Testing Persons for COVID-19](#).

Do existing commercially available multiple respiratory virus panels detect SARS-CoV-2?

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Yes. There are commercially developed respiratory panels with multi-pathogen molecular assays that can detect respiratory pathogens, including SARS-CoV-2, influenza, and other human coronaviruses that can cause acute respiratory illness. The U.S. Food and Drug Administration (FDA) maintains a list of tests that includes [viral tests with Emergency Use Authorization](#) (EUA).

If a patient tests positive for another respiratory virus, should that exclude SARS-CoV-2 as a cause of illness?

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Patients can be infected with more than one virus at the same time. Coinfections with other respiratory viruses in people with COVID-19 have been reported. Therefore, identifying infection with one respiratory virus does not exclude SARS-CoV-2 virus infection.

Should chest CT be used for diagnosis of COVID-19?

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Clinicians considering use of chest CT scans for diagnosis or management of COVID-19 patients should consider whether such imaging will change clinical management. The American College of Radiology (ACR) recommends that CT should not be used to screen for COVID-19, or as a first-line test to diagnose COVID-19, and that CT should be used sparingly and reserved for hospitalized, symptomatic patients with specific clinical indications for CT. Appropriate infection control procedures should be followed before scanning subsequent patients. For more information see, [ACR Recommendations for the use of Chest Radiography and Computed Tomography \(CT\) for Suspected COVID-19 Infection](#).

Whom should healthcare providers notify if they suspect a patient has COVID-19?

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Healthcare providers should immediately notify infection control personnel at their facility if they suspect COVID-19 in a patient. If a patient tests positive, providers should report that positive result to their local/state health department.

How do you diagnose and report a potential case of multisystem inflammatory syndrome in children (MIS-C)?

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Patients with MIS-C have presented with a persistent fever and a variety of signs and symptoms including multiorgan (e.g., cardiac, gastrointestinal, renal, hematologic, dermatologic, neurologic) involvement and elevated inflammatory markers. Not all children will have the same symptoms. For children who may have MIS-C, further evaluation for signs of this syndrome may include (but are not limited to) chest radiograph, echocardiography, and blood testing to evaluate for evidence of inflammation.

Healthcare providers who have cared or are caring for patients younger than 21 years of age meeting MIS-C criteria should report suspected cases to their local, state, or territorial health department. After hour phone numbers for health departments are available at the [Council of State and Territorial Epidemiologists website](#). For additional reporting questions, please contact CDC’s 24-hour Emergency Operations Center at 770-488-7100. For more information, including a full case definition, please visit [MIS-C Information for Healthcare Providers](#).

# Treatment and Management

Should post-exposure prophylaxis be used for people who may have been exposed to a person with COVID-19?

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There is currently no FDA-approved post-exposure prophylaxis for people who may have been exposed to COVID-19. For information about registered clinical trials of investigational therapeutics for pre or post exposure prophylaxis of SARS-CoV-2 infection, visit [ClinicalTrials.gov](#).



For more information on movement restrictions, monitoring for symptoms, and evaluation after possible exposure to COVID-19, see [Interim US Guidance for Risk Assessment and Public Health Management of Persons with Potential Coronavirus Disease 2019 \(COVID-19\) Exposure in Travel-associated or Community Settings](#) and [Interim U.S Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease 2019 \(COVID-19\)](#).

The National Institutes of Health recently published guidelines on prophylaxis use, testing, and management of COVID-19 patients. For more information, please visit: [National Institutes of Health: Coronavirus Disease 2019 \(COVID-19\) Treatment Guidelines](#) .

How are COVID-19 patients treated?

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Not all patients with COVID-19 will require medical supportive care. Clinical management for hospitalized patients with COVID-19 is focused on supportive care for complications, including supplemental oxygen and advanced organ support for respiratory failure, septic shock, and multi-organ failure. Empiric testing and treatment for other viral or bacterial etiologies may be warranted.

Corticosteroids are *not* routinely recommended for treatment of viral pneumonia or ARDS, due to the potential for prolonging viral replication, as has been observed with MERS coronavirus and influenza. Corticosteroids should be avoided unless they are indicated for another reason (e.g., COPD exacerbation or refractory septic shock following the [Surviving Sepsis Campaign Guidelines](#) ).

For information on investigational therapies, see [Therapeutic Options for Patients with COVID-19](#).

Do patients with confirmed or suspected COVID-19 need to be admitted to the hospital?

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Not all patients with COVID-19 require hospital admission. Patients whose clinical presentation warrants in-patient clinical management for supportive medical care should be admitted to the hospital under appropriate isolation precautions.

Some patients with initial mild clinical presentation may worsen in the second week of illness. The decision to monitor these patients in the inpatient or outpatient setting should be made on a case-by-case basis. This decision will depend not only on the clinical presentation, but also on the patient’s ability to engage in self-monitoring, the feasibility of safe isolation at home, and the risk of transmission in the patient’s home environment. For more information, see [Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 \(COVID-19\) in a Healthcare Setting](#) and [Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019 \(COVID-19\)](#).

When can patients with confirmed COVID-19 be discharged from the hospital?

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Patients can be discharged from the healthcare facility whenever clinically indicated. Isolation should be maintained at home if the patient returns home before the time period recommended for discontinuation of hospital [Transmission-Based Precautions](#).

Decisions to discontinue Transmission-Based Precautions or in-home isolation can be made on a case-by-case basis in consultation with clinicians, infection prevention and control specialists, and public health authorities based upon multiple factors, including disease severity, illness signs and symptoms, and results of laboratory testing for COVID-19 in respiratory specimens.

See [Interim Considerations for Disposition of Hospitalized Patients with COVID-19](#). For non-hospitalized persons, see [Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for COVID-19](#), and [Discontinuation of In-Home Isolation for Immunocompromised Persons](#).

# Caring for Recovered Patients

What do we know about detection of SARS-CoV-2 RNA after clinical recovery from COVID-19?

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Many recovered persons do not have detectable SARS-CoV-2 RNA in upper respiratory tract specimens. In others, viral RNA can be persistently detected by RT-PCR in respiratory tract samples after clinical recovery. In some persons, after testing negative by RT-PCR in two consecutive samples, later samples can test positive again. Whether persistent or recurrent, these repeated detections of viral RNA consistently are associated with higher cycle threshold (Ct) values (i.e., fewer RNA copies) than were found in earlier RT-PCR results in samples collected shortly or and during clinical illness. Studies that have looked at how long SARS-CoV-2 RNA can be detected in adults have demonstrated that in some persons it can be detected for weeks.

**Are clinically recovered persons infectious to others if they test persistently or recurrently positive for SARS-CoV-2 RNA?** +

Whether the presence of detectable but low concentrations of viral RNA after clinical recovery represents the presence of potentially infectious virus is unknown. Based on experience with other viruses, it is unlikely that such persons pose an infectious risk to others. However, whether this is true for SARS-CoV-2 infection has not been definitively established.

Typically, after the onset of illness, the detectable viral burden declines. After a week or more, anti-SARS-CoV-2 immunoglobulin becomes detectable and antibody titers rise. Some of these antibodies may prevent the virus from infecting cells in cell culture. The decline in viral burden is associated with decreased ability to isolate live virus. Efforts to isolate live virus from upper respiratory tract specimens have been unsuccessful when specimens are collected more than 10 days after illness onset.

Persons who have tested persistently or recurrently positive for SARS-CoV-2 RNA have shown stable or improving signs of illness. When viral isolation in tissue culture has been attempted in such persons in South Korea and the United States, live virus has not been isolated. In addition, there is no evidence that clinically recovered persons with persistent or recurrent detection of viral RNA have transmitted COVID-19 to others.

Despite encouraging observations to date, it's not possible to conclude that persons with persistent or recurrent detection of SARS-CoV-2 RNA are no longer infectious. There is no firm evidence yet that the antibodies that develop in response to infection are protective. If these antibodies are protective, it's not known what antibody titers are associated with protection from reinfection.

Based on these data and experience with other viral infections, most persons recovered from COVID-19 who test persistently or recurrently positive by RT-PCR are likely no longer infectious. Additionally, the magnitude and persistence of the immune response following recovery may vary among individuals, with factors such as age potentially influencing protection. Based on limited available data, determinations must be made on a case-by-case basis as to whether recovered persons with persistently detectable SARS-CoV-2 RNA are potentially infectious to others and should continue to be in home isolation and excluded from work, school, or other group settings. Such determinations are typically made in consultation with infectious diseases specialists and public health officials, after review of available information (e.g., medical history, time from initial positive test, RT-PCR Ct values, and presence of COVID-19 signs or symptoms).

**Can cycle threshold (Ct) values be used to assess when a person is no longer infectious?** +

No. Although attempts to culture virus from upper respiratory specimens have been largely unsuccessful when Ct values are in high but detectable ranges, Ct values are not a measure of viral burden, are not standardized by RT-PCR platform, and have not been approved by FDA for use in clinical management. CDC does not endorse or recommend use of Ct values to assess when a person is no longer infectious; however, serial Ct values may be useful in the context of the entire body of information available when assessing recovery and resolution of infection.

**What further evidence is needed to be reassured that persistent or recurrent shedding of SARS-CoV-2 RNA after recovery does not represent the presence of infectious virus?** +

Prospectively collecting serial respiratory samples and attempting to isolate live virus in tissue culture from multiple persons testing positive by RT-PCR following illness recovery is generally required. If repeated attempts to recover replication-competent virus in culture from such serial samples are unsuccessful that is considered sufficient

evidence that infectious virus is absent, and that persons continuing to test positive do not pose an infectious risk to other people

**Can viral culture be used to demonstrate that a person who had persistently or recurrently detectable viral RNA is not infectious to others?** +

Yes. However, viral culture is not widely performed for SARS-CoV-2. It must be conducted in Biosafety Level 3 (BSL-3) laboratories using BSL-3 practices by experienced virologists and results can take a week or more. Therefore, while persons whose specimens do not yield live virus are considered no longer infectious, the complexity of such testing and the time required to complete it mean that it is unlikely to be useful to guide management of infected persons.

**A person who previously tested positive by RT-PCR for SARS-CoV-2 and clinically recovered from COVID-19 is later tested again, for example as part of a contract tracing investigation. If that person again tests positive by RT-PCR, should they be managed as potentially infectious to others, and isolated again for COVID-19?** +

The person should be managed as potentially infectious and isolated. When a positive test occurs less than about 6 weeks after the person met [criteria for discontinuation of isolation](#), it can be difficult to determine if the positive test represents a new infection or a persistently positive test associated with the previous infection. If the positive test occurs more than 6-8 weeks after the person has completed their most recent isolation, clinicians and public health authorities should consider the possibility of reinfection. Ultimately, the determination of whether a patient with a subsequently positive test is contagious to others should be made on a case-by-case basis, in consultation with infectious diseases specialists and public health authorities, after review of available information (e.g., medical history, time from initial positive test, RT-PCR Ct values, and presence of COVID-19 signs or symptoms). Persons who are determined to be potentially infectious should undergo evaluation and remain isolated until they again meet criteria for discontinuation of isolation or of [transmission-based precautions](#), depending on their circumstances.

**If a previously infected person has clinically recovered but later develops symptoms consistent with COVID-19, should the person be isolated again and tested for SARS-CoV-2?** +

Yes, they should be isolated and retested. Persons who test positive for SARS-CoV-2 by RT-PCR come out of isolation after meeting criteria for the [symptom-based or test-based strategy](#). We do not know the degree to which previous COVID-19 illness protects against a subsequent SARS-CoV-2 infection or for how long persons are protected. Currently, serologic testing cannot be used to determine if this person may be reinfected. A positive serologic test may be evidence of the prior infection, but it remains unknown to what degree persons with detectable anti-SARS-CoV-2 antibodies are immune to reinfection. Contact tracing for the second period of symptoms (new case investigation) may be warranted.

**If an infected person has clinically recovered and then later is identified as a contact of a new case, do they need to be quarantined?** +

Yes, they should follow quarantine recommendations for contacts. We do not know to what degree or duration persons are protected against reinfection with SARS-CoV-2 following recovery from COVID illness. A positive serologic test may be evidence of prior infection, but it remains unknown whether persons with detectable anti-SARS-CoV-2 antibodies are immune to reinfection.

**If an infected person has clinically recovered using the symptom-based strategy, do they need a test of cure?** +

No. The [symptom-based strategy](#) is intended to replace the need for repeated testing.

**If an infected person has clinically recovered, should the person continue to wear a cloth face covering in public?** +

Yes. It is recommended that almost all persons wear [cloth face coverings](#) in public<sup>1</sup>. The primary purpose of cloth face coverings is to limit transmission of SARS-CoV-2 from infected persons who may be infectious but do not have clinical symptoms of illness or may have early or mild symptoms that they do not recognize. Fabric face coverings may also offer the wearer some protection against re-exposure to SARS-CoV-2, provide reassurance to others in public settings, and act as a reminder of the need to maintain social distancing. However, cloth face coverings are not personal protective equipment (PPE) and should not be used instead of a respirator or a facemask to protect a healthcare worker.



[1] Cloth face coverings should not be placed on young children under age 2, anyone who has trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the mask without assistance.

## Obstetrical Care

Does CDC recommend use of facemasks or respirators for healthcare personnel (HCP) caring for pregnant patients with known or suspected COVID-19 infection?

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When available, respirators (or facemasks if a respirator is not available), eye protection, gloves, and gowns should be used for the care of patients with known or suspected COVID-19 infection, including women who are pregnant. For more information, please see [Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 \(COVID-19\) in Healthcare Settings](#).

How should the use of N95 respirators be prioritized within obstetric healthcare settings during shortages?

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During respirator shortages, care should be taken to ensure that N95 respirators are reserved for situations where respiratory protection is most important, such as performance of aerosol-generating procedures on patients with suspected or confirmed COVID-19 infection. In such shortage situations, facemasks might be used for other types of patient care.

Alternatives to N95 respirators might be considered where feasible. These include other classes of NIOSH-approved filtering facepiece respirators, half facepiece or full facepiece elastomeric respirators, and powered air-purifying respirators (PAPRs) where feasible. All of these alternatives will provide equivalent or higher protection than N95 respirators when properly worn. However, PAPRs and elastomeric respirators should **not** be used in surgical settings due to concerns that exhaled air may contaminate the sterile field. For more information please see: [Strategies for Optimizing the Supply of N95 Respirators: Conventional Capacity Strategies](#).

When respirator supplies are restored, the facility can switch back to use of N95 respirators for all care of patients with known or suspected COVID-19 infection. For more information, please see [Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 \(COVID-19\) in Healthcare Settings](#).

Is forceful exhalation during the second stage of labor considered an aerosol-generating procedure for respirator prioritization during shortages?

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Based on limited data, forceful exhalation during the second stage of labor would not be expected to generate aerosols to the same extent as procedures more commonly considered to be aerosol generating (such as bronchoscopy, intubation, and open suctioning). Forceful exhalation during the second stage of labor is not considered an aerosol-generating procedure for respirator prioritization during shortages over procedures more likely to generate higher concentrations of infectious respiratory aerosols.

When respirator supplies are restored, as with all clinical care activities for patients with known or suspected COVID-19, HCP should use respirators (or facemasks if a respirator is not available), eye protection, gloves, and gowns during the second stage of labor, in addition to other personal protective equipment that may be typically indicated for labor and delivery. For more information please see: [Healthcare Infection Prevention and Control FAQs](#)

Is use of high-flow oxygen considered an aerosol-generating procedure for respirator prioritization during shortages?

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Based on limited data, high-flow oxygen use is not considered an aerosol-generating procedure for respirator prioritization during shortages over procedures more likely to generate higher concentrations of infectious respiratory aerosols (such as bronchoscopy, intubation, and open suctioning). Patients with known or suspected COVID-19 should receive any interventions they would normally receive as standard of care. When respirator supplies are restored, as with all clinical care activities for patients with known or suspected COVID-19, respirators (or

facemasks if a respirator is not available). eye protection. gloves. and gowns should be used by HCP for the care of

Should intrapartum fever be considered as a possible sign of COVID-19 infection? +

Clinicians should use their judgment to determine if a patient has [signs and symptoms](#) compatible with COVID-19 and whether the patient should be tested. Fever is the most commonly reported sign; most patients with confirmed COVID-19 have developed fever and/or symptoms of acute respiratory illness (cough, difficulty breathing).

Data regarding COVID-19 in pregnancy are limited; according to current information, presenting signs and symptoms are expected to be similar to those for non-pregnant patients, including the presence of fever.

Other considerations that may guide testing are epidemiologic factors such as the occurrence of local community transmission of COVID-19 infections. As part of evaluation, clinicians are strongly encouraged to test for other causes of respiratory illness and peripartum fever. For more information please see: [Evaluating and Testing Persons for Coronavirus Disease 2019 \(COVID-19\)](#)

What guidance is available for labor and delivery HCP with potential exposure in a healthcare setting to patients with COVID-19 infection? +

HCP in labor and delivery healthcare settings should follow the same infection prevention and control recommendations and personal protective equipment recommendations as all other HCP. If HCP are exposed to patients with COVID-19 infection, guidance is available for HCP and healthcare facilities on steps to take. For more information, please see: [Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease \(COVID-19\)](#)

Drugs and Investigational Therapies

Are empiric antibiotics recommended for patients suspected of having COVID-19? +

Several patients with COVID-19 have been reported to present with concurrent community-acquired bacterial pneumonia. Decisions to administer antibiotics to COVID-19 patients should be based on the likelihood of bacterial infection (community-acquired or hospital-acquired), illness severity, and antimicrobial stewardship issues. For more information, see [Diagnosis and Treatment of Adults with Community-acquired Pneumonia: An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America](#) [↗](#) .

What antiviral drugs are available to treat COVID-19? +

There are currently no antiviral drugs approved by FDA to treat COVID-19. See [Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease 2019 \(COVID-19\)](#).

- For information on use of investigational drugs for treatment of patients with COVID-19, see [Therapeutic Options for Patients with COVID-19](#).
- For information on specific clinical trials underway for treatment of patients with COVID-19 infection, visit [clinicaltrials.gov](#) [↗](#) .

Do nonsteroidal anti-inflammatory drugs (NSAIDs) worsen the course of disease for people with COVID-19? +

CDC is currently not aware of scientific evidence establishing a link between NSAIDs (e.g., ibuprofen, naproxen) and worsening of COVID-19. [FDA](#) [↗](#) , the [European Medicines Agency](#) [↗](#) , the [World Health Organization](#), and CDC are continuing to monitor the situation and will review new information on the effects of NSAIDs and COVID-19 disease as it becomes available. For those who wish to use treatment options other than NSAIDs, there are other over-the-counter and prescription medications approved for pain relief and fever reduction. Patients who rely on NSAIDs to treat chronic conditions and have additional questions should speak to their healthcare provider for individualized management. Patients should use NSAIDs, and all medications, according to the product labels and advice of their healthcare professional.

# Patients with Asthma

If I have patients with asthma, do I need to make any changes to their daily asthma preventive management regimens to reduce their risk of getting sick with COVID-19? +

People with moderate to severe **asthma**, particularly if not well controlled, [might be at higher risk](#) of getting very sick from COVID-19.

Based on what we currently know about COVID-19, the selection of therapeutic options through guideline-recommended treatment of asthma has not been affected. [National asthma guidelines](#) are available. Continuation of inhaled corticosteroids is particularly important for patients already using these medications because there is no evidence of increased risk of COVID-19 morbidity with use of inhaled corticosteroids and an abundance of data showing reduced risk of asthma exacerbation with maintenance of asthma controller therapy.

Patients with asthma but without symptoms or a diagnosis of COVID-19 should continue any required nebulizer treatments.

If my patient experiences an asthma exacerbation, should the exacerbation be treated any differently to reduce risk of COVID-19? +

Selection of therapeutic options through guideline-recommended treatment of asthma exacerbations has not been affected by what we currently know about COVID-19.

Systemic corticosteroids should be used to treat an asthma exacerbation per [national asthma guidelines](#) and current standards of care, even if it is caused by COVID-19. Short-term use of systemic corticosteroids to treat asthma exacerbations should be continued. There is currently no evidence to suggest that short-term use of systemic corticosteroids to treat asthma exacerbations increases the risk of developing severe COVID-19, whereas there is an abundance of data to support use of systemic steroids for moderate or severe asthma exacerbations.

Patients with asthma but without symptoms or a diagnosis of COVID-19 should continue any required nebulizer for treatments, as recommended by national professional organizations, including the American Academy of Allergy, Asthma & Immunology (AAAAI) and the American College of Allergy, Asthma & Immunology (ACAAI). If healthcare providers need to be present during nebulizer use among patients who have either symptoms or a diagnosis of COVID-19, use [CDC’s recommended precautions when performing aerosol-generating procedures \(AGPs\)](#).

Clinicians may be concerned that an asthma exacerbation is related to an underlying infection with COVID-19. Clinicians can access laboratory testing for COVID-19 through a network of state and local public health laboratories across the country. Lists of [states and territories with laboratories](#) that are using COVID-19 viral tests are available. For more information, see [Testing in U.S.](#) Clinicians should direct testing questions to their [state](#) and [local](#) health departments.

Are any changes recommended to the asthma treatment plan if my patient with asthma has COVID-19? +

Patients can be referred to [CDC’s recommendations for caring for themselves or someone else at home sick with COVID-19](#).

If nebulizer use at home is necessary for patients with asthma who have symptoms or a diagnosis of COVID-19, use of the nebulizer in a location that minimizes and preferably avoids exposure to any other members of the household, and preferably a location where air is not recirculated into the home (like a porch, patio, or garage) is recommended by national professional organizations, including the American College of Allergy, Asthma & Immunology (ACAAI) by the ACAAI and the Allergy & Asthma Network (AAN). Limiting the number of people in the room or location where the nebulizer is used is also recommended by the Asthma & Allergy Foundation of America (AAFA). Nebulizers should be used and cleaned according to the manufacturer’s instructions.

If nebulizer use in a healthcare setting is necessary for patients who have either symptoms or a diagnosis of COVID-19, use [CDC’s recommended precautions when performing aerosol-generating procedures \(AGPs\)](#).

# Patients with Liver Disease

Should people with COVID-19 and increased ALT or AST be tested for viral hepatitis?

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Yes, for your COVID-19 patients with risk factors for viral hepatitis and elevated hepatic enzymes, consider testing them for hepatitis A virus, hepatitis B virus, and hepatitis C virus infections. However, elevated alanine aminotransferase (ALT) or aspartate aminotransferase (AST) may also be associated with COVID-19 alone and indicate greater severity of illness. For more information, review [CDC’s Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease \(COVID-19\)](#)

During the COVID-19 pandemic, should high-risk populations continue to be vaccinated for hepatitis A in response to the ongoing hepatitis A outbreaks?

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Yes. People susceptible to hepatitis A virus (HAV) infection during the current hepatitis A outbreaks should receive the hepatitis A vaccine when possible. This includes:

- people who use drugs (injection or non-injection)
- people experiencing unstable housing or homelessness
- men who have sex with men (MSM)
- people who are or were recently incarcerated
- people with chronic liver disease (including cirrhosis, hepatitis B, or hepatitis C) and living or working in areas where the [hepatitis A outbreaks](#) are ongoing

Vaccination in settings such as jails, other correctional facilities, and homeless shelters should continue if already previously planned and organized in a way that would adhere to infection control practices and where relevant social distancing standards can be maintained. However, efforts should be made to vaccinate people in non-congregate settings that allow for social distancing. Whenever possible, vaccination efforts in non-congregate settings should continue for people at highest risk of acquiring HAV infection or developing serious complications from HAV infection, if social distancing standards can be maintained.


Should routinely recommended hepatitis A and hepatitis B vaccines continue to be administered to children?

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Routine hepatitis A and hepatitis B vaccination of children should continue to the extent possible, according to the [CDC immunization schedules](#).

## Maintaining Childhood Immunizations During COVID-19 Pandemic

The COVID-19 pandemic is changing rapidly and continues to affect communities across the United States differently. Some of the strategies used to slow the spread of disease in communities include postponing or cancelling non-urgent elective procedures and using telemedicine instead of face-to-face encounters for routine medical visits.

Different strategies are needed to ensure the delivery of newborn care and well-child care, including childhood immunizations. Healthcare providers in communities affected by COVID-19 are using [strategies to separate well visits from sick visits](#) . Examples include:

- Scheduling well visits in the morning and sick visits in the afternoon.
- Separating patients spatially, such as by placing patients with sick visits in different areas of the clinic or another location from patients with well visits.
- Collaborating with providers in the community to identify separate locations for holding well visits for children.

Because of personal, practice, or community circumstances related to COVID-19, some providers may not be able to provide well-child care, including immunizations, for all patients in their practice. **If a practice can provide only limited well-child visits, healthcare providers are encouraged to prioritize newborn care and vaccination of infants and young children (through 24 months of age) when possible.** CDC is monitoring the situation and will continue to provide guidance.

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Should vaccination of HBV-exposed infants continue during the COVID-19 pandemic?

Yes. Hepatitis B vaccination of all infants, especially those exposed to hepatitis B virus, should occur according to the Advisory Committee on Immunization Practices (ACIP) recommendations.

Labor and Delivery Care

- Identify HBsAg status of all women presenting for delivery.
- If a woman’s HBsAg status is positive, HBIG and single antigen hepatitis B vaccine should be administered to her infant within 12 hours of birth.
- If a woman’s HBsAg status is unknown, single antigen hepatitis B vaccine should be administered to her infant within 12 hours of birth. Administration of HBIG should be determined per ACIP recommendations (see <https://www.cdc.gov/mmwr/volumes/67/rr/rr6701a1.htm>). Infants weighing <2,000 grams should receive HBIG if the mother’s HBsAg status cannot be determined within 12 hours of birth.
- Provide the birth dose of hepatitis B vaccine to all other newborns within 24 hours of birth to prevent horizontal hepatitis B virus transmission from household or other close contacts.

Should management of infants born to HBV-infected women continue during the COVID-19 pandemic? +

Yes. Management should continue to prevent mother-to-child transmission of hepatitis B.

Pediatric Care of HBV-exposed Infants

- Make every effort to ensure HBV-exposed infants complete the hepatitis B vaccine series following the ACIP recommendations (see <https://www.cdc.gov/mmwr/volumes/67/rr/rr6701a1.htm>). Providers using single-component vaccine who are experiencing immunization service disruption should administer hepatitis B vaccine as close to the recommended intervals as possible, including series completion at 6 months, and follow ACIP recommendations for post-vaccination serologic testing.
- If post-vaccination serologic testing is delayed beyond 6 months after the hepatitis B series is completed, consider administering a “booster” dose of single antigen hepatitis B vaccine and then ordering post-vaccination serologic testing (HBsAg & antibody to HBsAg [anti-HBs]) 1-2 months after the “booster” dose.

Should hepatitis A and hepatitis B vaccines continue to be administered to adults at risk for hepatitis A or hepatitis B? +

Yes. Continue to administer these vaccines if an in-person visit must be scheduled for some other purpose and the clinical preventive service can be delivered during that visit with no additional risk; or an individual patient and their clinician believe that there is a compelling need to receive the service based on an assessment that the potential benefit outweighs the risk of exposure to SARS-CoV-2 virus. For more information see [Delivery of Adult Clinical Preventive Services, Including Immunizations](#).

Patients with Hypertension

Are patients with hypertension at higher risk for severe illness from COVID-19? +

Although many patients with severe illness from COVID-19 have underlying hypertension, it is unclear at this time if hypertension is an independent risk factor for severe illness from COVID-19. Hypertension is common in the United States. Hypertension is more frequent with advancing age and among men, non-Hispanic blacks, and people with other underlying medical conditions such as obesity, diabetes, and serious heart disease. At this time, people whose only underlying medical condition is hypertension are not considered to be at higher risk for severe illness from COVID-19.

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Should angiotensin-converting enzyme inhibitors (ACE-Is) or angiotensin receptor blockers (ARBs) be stopped in patients with COVID-19?

No. The American Heart Association, the Heart Failure Society of America, and the American College of Cardiology [recommend](#) continuing ACE-I or ARB medications for all patients already prescribed those medications for indications such as heart failure, hypertension, or ischemic heart disease. At this time, available evidence demonstrates no indication of COVID-specific harm from these agents. Several randomized controlled trials are under way to better answer this important clinical question. Cardiovascular disease patients diagnosed with COVID-19 should be fully evaluated by a healthcare professional before adding or removing any treatments, and any changes to their treatment should be based on the latest scientific evidence. Patients who rely on ACE-Is or ARBs to treat chronic conditions and have additional questions should speak to their healthcare provider for individualized management

Waste Management

What do waste management companies need to know about wastewater and sewage coming from a healthcare facility or community setting with either a known COVID-19 patient or person under investigation (PUI)? +

Waste generated in the care of PUIs or patients with confirmed COVID-19 does not present additional considerations for wastewater disinfection in the United States. Coronaviruses are susceptible to the same disinfection conditions in community and healthcare settings as other viruses, so current disinfection conditions in wastewater treatment facilities are expected to be sufficient. This includes conditions for practices such as oxidation with hypochlorite (i.e., chlorine bleach) and peracetic acid, as well as inactivation using UV irradiation.

Do wastewater and sewage workers need any additional protection when handling untreated waste from healthcare or community setting with either a known COVID-19 patient or PUI? +

Wastewater workers should use standard practices including [basic hygiene precautions](#) and wear the recommended [PPE](#) as prescribed for their current work tasks when handling untreated waste. There is no evidence to suggest that employees of wastewater plants need any additional protections in relation to COVID-19.


Should medical waste or general waste from healthcare facilities treating PUIs and patients with confirmed COVID-19 be handled any differently or need any additional disinfection? +

Medical waste (trash) coming from healthcare facilities treating COVID-2019 patients is no different than waste coming from facilities without COVID-19 patients. CDC’s guidance states that management of laundry, food service utensils, and medical waste should be performed in accordance with routine procedures. There is no evidence to suggest that facility waste needs any additional disinfection.

More guidance about environmental infection control is available in section 7 of CDC’s [Interim Infection Prevention and Control Recommendations](#) for Patients with Confirmed COVID-19 or Persons Under Investigation for COVID-19 in Healthcare Settings.

Additional Resources

- [Clinical Care Guidance](#)
- [Therapeutic Options for Patient with COVID-19](#)
- [Guidance for Pediatric Healthcare Providers](#)
- [Disposition of Hospitalized Patients with COVID-19](#)
- [Inpatient Obstetric Healthcare Guidance](#)
- [Information for Healthcare Providers: COVID-19 and Pregnant Women](#)
- [Ending Isolation for Immunocompromised Patients](#)
- [Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease \(COVID-19\)](#)

- [Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 \(COVID-19\) in Healthcare Settings](#)
- [Strategies for Optimizing the Supply of N95 Respirators: Conventional Capacity Strategies](#)
- [Evaluating and Testing Persons for Coronavirus Disease 2019 \(COVID-19\)](#)
- [Healthcare Infection Prevention and Control FAQs](#)
- [National Institutes of Health: Coronavirus Disease 2019 \(COVID-19\) Treatment Guidelines](#) 

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